



# ELEPHANT

IN THE LAB

OPINION

## Towards the Open Natural History Museum

<b>Short title</b>	Towards the Open Natural History Museum
<b>Long title</b>	Open Science Activities at the Museum für Naturkunde Berlin
<b>Authors</b>	Maike Weißpflug <sup>1</sup>
<b>Author affiliation</b>	<sup>1</sup> Museum für Naturkunde, Berlin, Germany
<b>Author bios</b>	Maike Weißpflug is a political theorist and postdoctoral researcher at the Museum für Naturkunde Berlin. Besides open science, she is generally interested in how science interacts with society, especially in the field of citizen science. Also, she tries to understand modernity's ambiguous relationship to nature. Her new book on Hannah Arendt's art of political thinking will be published in March 2019 by Matthes & Seitz Berlin.
<b>Author social links</b>	Maike Weißpflug: <a href="#">Twitter</a>
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Museums, libraries and archives play a pivotal role in the preservation of human knowledge. They also see themselves as custodians of cultural and natural heritage. The task of natural history collections is twofold: on the one hand, they preserve our knowledge about nature, on the other, they hold records of the history of human exploration and conquest of the earth. With digitisation, natural history museums have new opportunities to make their collections accessible to wider audiences, and to interconnect the huge amounts of data and knowledge that is stored within their collections. Digitisation not only changes the way natural history collections are organised, but also the research process, as it enables scientists to cooperate without the constraints of time and location, to generate and analyse large amounts of data that can be exchanged and reused internationally in a wide range of new contexts. These opportunities have been recognised early. The Berlin Declaration on Open Access of 2003 states: “For the first time ever, the Internet now offers the chance to constitute a global and interactive representation of

human knowledge, including cultural heritage and the guarantee of worldwide access.” ([Berlin Declaration](#)). Libraries, art galleries and archives agreed in their [OpenGLAM principles](#) that their institutions would benefit from making their data and collections digitally available to everyone: “The internet presents cultural heritage institutions with an unprecedented opportunity to engage global audiences and make their collections more discoverable and connected than ever, allowing users not only to enjoy the riches of the world’s memory institutions, but also to contribute, participate and share.”

In natural history museums in general, and at the Museum für Naturkunde Berlin specifically, three distinctive dimensions of open science are potential strategies to react to digitization: 1) inner-scientific openness through data sharing, 2) openness to society through various forms of public engagement, and 3) citizen science, which can be understood as a hybrid between inner-scientific openness and public engagement. After all, sharing knowledge openly is not simply a matter of communicating research results, but also of entering into dialogue with a wide range of target audiences beyond the scientific community. New forms of participation are established between science and society, as in citizen science projects where citizens become involved in the research process itself. Citizen science even has the potential to produce knowledge that academic research cannot provide. For example, the [dramatic decline in insects](#) that led to an intense and ongoing public debate, was discovered by the [Entomological Society Krefeld](#), a local, more than century-old volunteer association studying insects.

The Museum für Naturkunde Berlin (MfN) has been engaged for a while in this entire range of Open Science activities:

- 1) **Inner-scientific openness.** There are several projects at the Museum für Naturkunde Berlin that are engaged in creating workflows and infrastructures for open biodiversity data. The [MfN’s vast natural history collections](#) alone contain 30 million specimens. Following the [Open Definition](#) “*Knowledge is open if anyone is free to access, use, modify, and share it – subject, at most, to measures that preserve provenance and openness*”, the museum is opening up its research processes and its collections, to find new answers to scientific and societal problems, like novel pharmaceuticals, securing the world’s food supplies or coping with the consequences of global warming. The vast archive of knowledge on biodiversity stored in the collections can be used far more efficiently when opened up and interconnected digitally. One example for this is the MfN-led German-Indonesian project [Indobiosys](#) which aims at standardising a sustainable workflow from taking samples, identification and storage of organisms from unexplored biodiverse habitats to their description. An online platform offers open access to the data on specific species and geography to the research community as well as to the general public. Openness has the potential speed up scientific progress through new forms of collaboration (e.g., data sharing) and safeguard scientific integrity through new forms of transparency (e.g., open methods, pre-registration, data-driven replications). Although at first glance, this creates high hopes in the sense of “*citius, altius, fortius*” (faster, higher, stronger), it comes with a few challenges to overcome, such as how best to archive and use research data and when, how and with whom research results should be shared.

- 2) **Openness to society.** While sharing research data affects the inner-scientific process itself, opening up the research process also applies to the areas of knowledge transfer and public engagement, with other words: the relationship between science and society. The museum offers a variety of event formats, making it a forum for the public and political discussions. In the current exhibition [ARTEFACTS](#), for example, scientists from the MfN (and from other research institutions) talk to museum visitors and engage in a dialogue about current environmental issues. The exchange aims at communicating research processes, but also at gaining new perspectives and ideas for the researchers themselves. In the event series "[Wissenschaft, natürlich!](#)" ("[Science, of course!](#)"), the Museum and the Berlin Social Science Center (WZB) are joining forces to publicly discuss some of the most pressing issues of our time across disciplinary boundaries. They invite the public to discuss about social cohesion in times of political and social divisions, about the ecological crisis and the role of science itself. Another example is the Museum's public engagement project [GenomELECTION](#), which explores how genome-editing methods such as CRISPR/CAS-9 shape the way we will feed ourselves in the future, how we define health and illness and, in more general terms, will define our society's relation to nature.
- 3) **Citizen science.** The current boom in citizen science could be interpreted as a sign for a transformation of the way our society produces and evaluates knowledge, a process that is largely welcomed and promoted by the Museum für Naturkunde Berlin. Hosting the headquarters of the [European Citizen Science Association](#) (ECSA), the European research network [COST Action Citizen Science](#) and the German national platform for citizen science "[Bürger schaffen Wissen](#)", the MfN has become a competence center for citizen science. It also runs its own citizen science projects, like the project on urban nightingales "[Forschungsfall Nachtigall](#)". During the 2018 and 2019 nightingale seasons, nature-loving citizens – including clubbers and other night owls – are asked to collect recordings of nightingale songs from April to early July, using the Museum's free [Naturblick](#) app. The data of the recordings and their location are freely accessible on the map on the Museum's website.

Over the past years, these and similar ideas and ways to open up science to society have been widely discussed as part of the ongoing Open Science debate. The notion of Open Science is complex and multi-faceted. It helps to distinguish various aspects of Open Science – there is the aspect of societal participation in science and free and equal access to knowledge for all, but there is also the aspect of increasing efficiency through open communication and the exchange of data within the science community, including the establishment of new digital infrastructures. Research museums like the Museum für Naturkunde Berlin are ideal places to open up science in both directions, inner-scientifically and societally, and they can be understood as essentially open institutions, with the mission of advancing research and making it available to society at the same time.

## References

Weißpflug, Maike und Stefanie Paß (Hg.) (2019). Open for Nature. Offene Wissenschaft am Museum für Naturkunde Berlin. [LINK](#).  
(accessed: 6th March, 2019)

Berlin Declaration. [LINK](#).  
(accessed: 4th March, 2019)

OpenGlam principles. [LINK](#).  
(accessed: 4th March, 2019)

Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, et al. (2017) More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE 12(10): e0185809. [LINK](#).  
(accessed: 4th March, 2019)

Entomological Society Krefeld. [LINK](#).  
(accessed: 4th March, 2019)

Museum für Naturkunde: natural history collections. [LINK](#).  
(accessed: 4th March, 2019)

Open Definition. [LINK](#).  
(accessed: 4th March, 2019)

Indobiosys. [LINK](#).  
(accessed: 4th March, 2019)

Museum für Naturkunde: ARTEFACTS. [LINK](#).  
(accessed: 4th March, 2019)

WZB: Wissenschaft, natürlich!" ("Science, of course!"). [LINK](#).  
(accessed: 4th March, 2019)

GenomELECTION. [LINK](#).  
(accessed: 4th March, 2019)

European Citizen Science Association. [LINK](#).  
(accessed: 4th March, 2019)

COST Action Citizen Science. [LINK](#).  
(accessed: 4th March, 2019)

Bürger schaffen Wissen. [LINK](#).  
(accessed: 4th March, 2019)

Forschungsfall Nachtigall. [LINK](#).  
(accessed: 4th March, 2019)

Museum für Naturkunde: Naturblick-Ap. [LINK](#).  
(accessed: 4th March, 2019)